REMARKS

Entry of the foregoing, reexamination and reconsideration of the subject matter identified in caption, as amended, and in light of the remarks which follow are respectfully requested.

As correctly noted in the Office Action Summary, claims 1 and 3-11 are pending in the application and are under consideration.

By the amendments, the preamble of claim 11 has been corrected.

Turning now to the Official Action, claim 11 stands objected to for the reasons set forth on page 2 of the Official Action. This objection has been obviated by the foregoing amendment to claim 11 in accordance with the Examiner's helpful suggestion.

Claims 1 and 3-11 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Knudsen (U.S. Patent No. 5,262,280) in view of EP '923 (EP 1 142 923 A1), Kiuchi '402 (U.S. Patent No. 6,730,402) or Kiuchi '776 (U.S. Publication No. 2003/0152776). For at least the reasons that follow, this rejection is improper and should be withdrawn.

At the outset, applicants note that the Official Action does not appear to address Kiuchi '402 or Kiuchi '776, and the inclusion of those documents in the rejection is improper at least for this reason.

The present invention relates generally to the field of negative-type photosensitive resin compositions. Claim 1 sets forth a negative-type photosensitive resin composition. The composition comprises an epoxy compound, poly(*p*-vinylphenol), and a phenol-biphenylene resin. Claim 4 sets forth a method for the formation of a resist pattern. The method comprises the steps of coating a negative-type photosensitive resin composition on a substrate, wherein the composition comprises an epoxy compound, poly(*p*-vinylphenol) and a phenol-biphenylene resin; exposing the resin composition; and developing of the exposed composition to form the resist pattern.

Knudsen relates to radiation sensitive compositions. The photoimageable compositions comprise a radiation sensitive component, a resin binder and a polybutadiene that comprises one or more internal epoxide groups. The compositions may further comprise a crosslinking agent such as a melamine or an epoxidized material, or mixtures thereof. (Abstract).

Knudsen does not disclose or suggest each feature of the presently claimed invention. For example, Knudsen does nor disclose or fairly suggest a negative-type photosensitive resin composition containing a phenol-biphenylene resin, as recited in independent claims 1 and 4. In an effort to cure this clear deficiency in Knudsen, the Examiner improperly relies on EP '923, Kiuchi '402 or Kiuchi '776.

EP '923 relates to an epoxy resin composition which can be used as a semiconductor encapsulating resin, and more specifically, to a flame retardant epoxy resin composition (p. 2, ll. 5-6). The epoxy resin composition comprises an epoxy resin (A), a phenolic resin (B), an inorganic filler (C) and a curing accelerator (D). A flexural modulus E (kgf/mm^2) at 240±20°C of a cured article obtained by curing the composition is a value satisfying $0.015W + 4.1 \leq E \leq 0.27W + 21.8$ in the case of $30 \leq W < 60$, or a value satisfying $0.30W - 13 \leq E \leq 3.7W - 184$ in the case of $60 \leq W \leq 95$ wherein W (wt%) is a content of the inorganic filler (C) in the cured article. The cured article of this composition forms a foamed layer during thermal decomposition or at ignition to exert flame retardancy. (Abstract).

Kiuchi '776 and Kiuchi '402 are, respectively, the U.S. application publication and granted patent corresponding to Application No. 10/070,827. Kiuchi '402 and Kiuchi '776 relate to a flame-retardant epoxy resin composition, as well as to a varnish solution, a prepreg and a laminate all made with the composition. The flame-retardant composition includes an epoxy resin, a curing agent, and a metal hydroxide. The curing agent is a phenolic resin containing, in the molecular chain, structural units derived from a phenol and structural units derived from an aromatic compound other than the phenol, or the epoxy resin is a novolac epoxy resin obtained by subjecting the phenolic hydroxyl groups of the phenolic resin to etherification with glycidyl. (Abstract).

The Examiner relies on Comparative Example 10 of EP '923. In this regard, the Examiner takes the position that:

> The composition is prepared from an epoxy resin and 2 phenolic resins are demonstrated in Comp. Ex. 10 (page 23). Phenolic resin 2 employed in that composition is a: phenol-biphenylaralkyl....
>
> [I]t would have been obvious ... to prepare the material of Knudsen et al choosing to employ a the specific phenol resin ... given that they are conventional in the art by

> Kiuchi et al with reasonable expectation of achieving a photoimageable composition having increased flexibility upon curing. (Official Action, page 3).

Applicants respectfully disagree with the Office's position for the following reasons.

As described above, the compositions in accordance with the EP '923 invention provide flame retardancy. More specifically, the compositions form in a cured article a foamed layer during thermal decomposition or at ignition for this purpose. EP '923 discloses that a flexural modulus E (kgf/mm^2) at 240±20°C of a cured article obtained by curing the composition is a value satisfying $0.015W + 4.1 \leq E \leq 0.27W + 21.8$ in the case of $30 \leq W < 60$, or a value satisfying $0.30W - 13 \leq E \leq 3.7W - 184$ in the case of $60 \leq W \leq 95$ wherein W (wt%) is a content of the inorganic filler (C) in the cured article. Table 7 (see pages 22-23) indicates for comparative example 10, that no foamed layer was observed, that the flexural modulus does not satisfy the forgoing relationship, and thus the self-extinguishing mechanism does not take place and combustion continues. For these reasons, EP '923 amounts to a teaching away from the use of the composition of comparative example 10, such that persons skilled in the art would not relied on EP '923 in the manner suggested.

Moreover, the entire basis for the combination of Knudsen with EP '923 is that increased flexibility would be imparted to the Knudsen composition by use of the EP '923 phenolic resin 2. There is, however, no suggestion in either Knudsen or EP '923 that a more flexible material would result in the Knudsen composition by the addition of phenolic resin 2 from EP '923. If anything, persons skilled in the art would expect that flexibility would be worsened by the addition of the EP '923 phenolic resin 2 to the Knudsen composition containing a poly(vinylphenol). In this regard, the rigidity of the phenyl and biphenyl segements in the backbone of phenolic resin 2 limits the freedom of motion in the chain compared to the linear saturated carbon backbone of poly(vinylphenol). One skilled in the art would, therefore, expect that incorporation of phenolic resin 2 from EP '923 into the Knudsen poly(vinylphenol) resin-based composition would result in a less flexible, not a more flexible, material upon curing as compared with the Knudsen poly(vinylphenol) resin-based composition.

Applicants note further that the flexural modulus for Comparative Example 10 of EP '923 was judged to be too high. A large flexural modulus translates into a low

flexibility, not a high flexibility. In consideration of flexibility characteristics, therefore, persons skilled in the art would not have relied on Comparative Example 10 of EP '923.

Persons skilled in the art would further not have combined the documents in the manner suggested in the Official Action because of the very substantial differences in function, use and composition of the described materials. As described above, Knudsen relates to photoimageable compositions. In stark contrast, the compositions of EP '923 (and Kiuchi '402 and Kiuchi '776) are thermally curable - not photoimageable. Persons intent on modifying the Knudsen photoimageable compositions would not have looked to the teachings relating to the thermally curable materials of the secondary documents. Knudsen discusses in the "Background" section electronics-related applications such as soldermasks in printed circuit board (PCB) manufacture, flexible circuit manufacture, multichip modules, and multilayer PCBs (col. 1, line 12 to col. 2, line 36). Conversely, the EP '923 (and Kiuchi '402 and Kiuchi '776) thermally curable compositions are disclosed for use as semiconductor encapsulating resins. The applications described by Knudsen and the secondary documents differ such that the material properties required of each would be expected to be significantly different. Still further, the photoimageable compositions described and exemplified in Knudsen and the thermally curable compositions of the secondary documents are also quite dissimilar. For example, the composition of Comparative Example 10 of EP '923 includes 90.0 wt% fused silica particles and only 9.2 wt% resin components. The compositions exemplified by Knudsen, on the other hand, include no silica particles and a much larger resin content. Because of these very significant differences in function, use and composition, persons skilled in the art would not have looked to the teachings of EP '923 to modify the compositions described by Knudsen.

For at least the reasons presented above, persons skilled in the art would not have combined Knudsen with EP '923, Kiuchi '402 or Kiuchi '776 in the manner suggested in the Official Action. Simply put, the Examiner has not established a *prima facie* case of obviousness. Accordingly, withdrawal of this rejection is respectfully requested.

From the foregoing, further and favorable action in the form of a Notice of Allowance is believed to be next in order, and such action is earnestly solicited.

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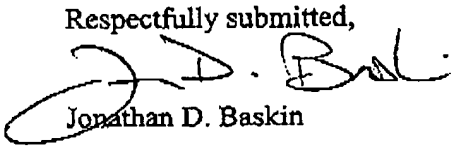
Attorney Docket No.: 51890

If there are any questions concerning this paper or the application in general, the Examiner is invited to telephone the undersigned at her earliest convenience.

Respectfully submitted,



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